



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912



January 20, 2021

Mark A. Young
Executive Director
Lowell Regional Wastewater Utility
First Street Boulevard
Lowell, MA 01850

Re: Integrated Capital Plan

Dear Mr. Young,

The United States Environmental Protection Agency ("EPA") and the Department of Environmental Protection ("MassDEP"), Northeast Regional Office have reviewed the City of Lowell's ("Lowell" or "City") Integrated Capital Plan ("Integrated Plan" or "ICP"), dated December 2019, and jointly transmit this comment letter.

To ensure a common understanding of the expectations for Lowell to implement its Integrated Plan, and provide for an enforceable schedule of integrated planning implementation, EPA's position, as was articulated as far back as 2016 during initial discussions with the City, is that the 1988 consent decree needs to be modified to incorporate integrated planning, including plans for CSO abatement and implementation schedules. Given that the original decree was entered in 1988, EPA and MassDEP believe that the best course of action is that a new judicial consent decree, rather than a modification, be developed by the parties.

The ICP presents Lowell's proposed plan for wastewater, drinking water, and stormwater capital and operational improvements from 2020 through 2035. Lowell has proposed that the ICP also serves as a Combined Sewer Overflow ("CSO") Phase 3 Long Term Control Plan ("LTCP"). The wastewater/CSO elements of the ICP specifically include the following elements:

- A description of the City's wastewater management facilities;
- Data collection consisting of systemwide temporary sewer flow metering, rainfall gauging, and water quality monitoring;
- Hydrologic and hydraulic model improvements and recalibration, based on updated metering data;

- CSO control alternatives analysis, including an assessment of the costs and benefits of higher levels of CSO control;
- Financial Capability and Affordability Analysis;
- Recommendations for upgrades to the Duck Island WWTP and other wastewater system projects to mitigate CSO discharges and their impacts; and
- An implementation schedule for recommended wastewater projects.

MassDEP and EPA have reviewed the ICP and have prepared the following comments on wastewater and stormwater elements of the ICP. While MassDEP and EPA acknowledge Lowell's needs as presented in the ICP for Drinking Water infrastructure improvements, the comments in this letter pertain only to the elements of the ICP which address the City's wastewater infrastructure and CSO discharges. Accordingly, MassDEP and EPA request the City to address the following comments, which will be critical to providing the information needed to assess the scope and schedule for the City's CSO abatement program:

General Comments:

- A. Sewer System Characterization: The ICP only has a single reference to the sewer system regarding how much of the system is separated vs. how much is combined. The percentages of separated and combined systems should be added to the system description, including the "site sheets" included in Section 5, in linear feet of sewer and acreage. The description of the sewersheds should also note where the flows from customer communities discharge into the Lowell collection system.
- B. ICP Criteria Weighting: The Agencies have a different view of the weighting than the City. For instance, Drinking Water Resource protection should have more weight. Since this is addressed elsewhere in the Agencies' comments, the City does not need to modify this element of the ICP.
- C. North Bank Storage & Treatment Facility: MassDEP and EPA agree that the conditions and flow conveyance pathways documented in the ICP make the proposed location of the North Bank CSO storage and treatment facility a favorable location for implementing cost-effective CSO control measures. However, the extent of CSO abatement and water quality benefits which will result are a critical element of MassDEP and EPA review of this proposal, and its acceptability as part of the City's LTCP. Accordingly, the City must provide additional details on this proposal:
 - i. Storage impacts: The ICP indicates that the storage facility will be on the order of 1 MG in volume. Please indicate whether this is based on the available space on the site, or if this is being sized to store a certain size design storm. The typical year system model should be run to: identify estimates of how many storms will cause activations of the facility; how many storms will be stored without a discharge; and how many storms will result in treatment/discharge. Sizing of the storage facility should be optimized to provide the highest feasible level of CSO control. In that regard the City should evaluate increasing the storage volume of the facility in combination with the lower weir heights as presented in the ICP to determine the impact on further reducing systemwide CSOs from those presented in the ICP. It

is understood that this configuration may impact the gravity hydraulics and may require a post event dewatering pumping system to discharge any remaining stored flow in the storage tank.

- ii. Climate Change impacts: A major presumption is that the facility will not require any CSO discharge pumping elements given the hydraulics of the North Bank Interceptor and the elevation of the site and discharge. The City should state whether there has been a review of climate change impacts in reaching this conclusion (i.e., has the City evaluated a range of river stage elevations). If this recommended approach is carried forward, an analysis of potential climate change conditions will be needed during the preliminary design stage.
- iii. Total Suspended Solids (TSS) removal: The ICP indicates that the facility, when in an active discharge condition, will remove 50% of the influent TSS. The City needs to review and provide data from similar facilities and analyze other technologies in order to maximize TSS removal in order to achieve a 50% or greater TSS removal. Lower TSS removal has the potential to impact the effectiveness of the disinfection process.
- iv. Chlorine Disinfection: The ICP indicates that the North Bank Treatment Facility will include a disinfection process. What are the City's plans for disinfection at the North Bank Treatment Facility? How does the City plan to address the toxic impacts of chlorine and chlorine byproducts on aquatic life? Please be aware that NPDES permit coverage will be ultimately required for the proposed facility.

If the technical issues noted above are resolved with MassDEP and EPA, this project must be prioritized in the Implementation Plan, so that significant CSO abatement benefits can be realized as soon as possible.

- D. Douglas and Pevey Storage Projects: The ICP includes these two projects, which emerged as high priorities in areas "vulnerable to surcharging." While there have been some discussions about the Pevey site, there have been few, if any, discussions about the Douglas site. These two projects collectively amount to approximately \$20 million in spending and have been prioritized ahead of competing CSO control projects in other areas, including the proposed North Bank CSO facility. The City needs to provide justification for prioritizing these two projects ahead of others, and include a more detailed description of the benefits of the recommended projects. For each project, please provide details on the surcharging, sanitary sewer overflows, public health risk, and any alternatives assessment completed for these sites.
- E. I/I Program: There is very little commitment in the ICP for any I/I abatement work. EPA and MassDEP acknowledge that most of the City is served by a combined system, but there is still the potential for cost-effective I/I removal in some areas. Further, all the sewer separation options assessed in the ICP involve no element of private I/I removal, without which the success of any sewer separation effort could be severely compromised. Since sewer separation is recommended in the Tilden area, private I/I assessment and removal must be an element of that project. In addition, MassDEP will require the City to provide a separate, detailed description of the City's I/I abatement program. The City also needs to describe how it plans to implement the requirement to

remove 4 gallons of I/I for each gallon of new design flow for any new sewer connections that include > 15,000 gpd of design flow.

- F. Modeling vs. Measured Flows: The matchup of CSO volume modeled vs. measured in Figure 4-23 is not ideal. Please provide data for the modeled activations vs. measured activations. While there should be no need to go back and re-meter or re-calibrate the model for the purpose of the ICP analysis, preliminary design work for any of the wastewater projects should include a contract task to establish appropriate design flows for the recommended plan projects.
- G. High Rate Clarification: The ICP dismisses this as an option at CSO diversion sites but carries it forward at the WWTP (though this was not apparent in the analysis). MassDEP generally agrees with the screening that was done, apart from exploring this option at the site of the North Bank facility. Since the North Bank site appears to have more space for CSO storage and treatment, the City needs to evaluate the costs and benefits of this higher-level treatment.
- H. Diversion Station Optimizations: These recommended projects, involving replacement of the gates at the Merrimack and Warren CSO diversion sites, cost approximately \$0.4 million, and the model indicates they both have substantial benefits to reducing CSO's. However, they are not proposed in the ICP's recommended plan until 2027. MassDEP and EPA's position is that these projects should be fast-tracked.
- I. Sewer Separation Cost Estimates: The ICP relies on sewer separation work done in Syracuse back in 2003 for developing cost estimates, which was based on the construction of a new sanitary sewer system. MassDEP's experience has been that construction of a new storm drain system is often a favored approach, as in some cases, engineering and construction costs can be lower given the elevations of the drain vs. the sewer system. Since the proposed Lowell work is not the same as that in Syracuse, the City needs to provide additional support for the costs included in the ICP. Moreover, the City did not appear to use the Syracuse estimates in identifying the costs for the sewer separation work in the Tilden area, the only area recommended for sewer separation. Instead, cost information from sewer separation work done in the Lowell was used to support that estimate. The City should use available City data for estimating the sewer separation costs in the entire planning area. Lastly the cost of sewer separation by sewershed should be presented.
- J. Storage Tank Estimates: The ICP uses cost estimates for generic 12-foot deep underground offline storage tanks to evaluate several storage scenarios. This tank depth seems very shallow and likely increases the site area required for tanks, therefore impacting the overall costs and feasibility of placing tanks at certain locations throughout the City. Please explain whether the site conditions limit storage tank depths to 12 feet.
- K. Wastewater Pump Stations: While the ICP notes that the City has ten wastewater pump stations, there are no assessments, nor any provisions included in the ICP for upgrades to any of the stations. The City needs to provide information on the condition of the pump stations since upgrade costs may be necessary in the ICP planning period.
- L. Duck Island WWTP: While the City has undertaken many upgrades to the WWTP in the past 10 years, the ICP includes a number of upgrades to the Duck Island WWTP and

includes CSO control alternatives involving increased WWTP capacity. The City needs to explain if the recommendations to increase WWTP capacity are based on an engineering assessment of the plant unit operations. If there are supporting technical memoranda, this should be included in the Appendix.

Specific Comments:

In addition, EPA and MassDEP request that Lowell address and provide additional information regarding the following review comments (referenced by Chapter and Section of the ICP):

1. Chapter 1, Section 1.4: ICP notes since implementation of NMC, Lowell has reduced systemwide CSO discharges by over 80%, but no supporting history with data is included.
2. Chapter 1, Section 1.6: ICP notes that based on predictions from the calibrated model, Lowell's sewer system conveys 83.7% of total volume of combined flow to WWTP under existing baseline conditions. The City needs to clarify the definition of "baseline" condition.
3. Chapter 2, Section 2.2 states that the Phase II LTCP was submitted in August 2014; the ICP needs to indicate which, if any, of the recommended projects has gone forward.
4. Chapter 3, Section 3.14 states that Lowell has purchased an automatic bacteria sampling system that will be evaluated in a pilot study in 2020. The City needs to provide an update indicating if the system has been deployed, and a summary of the data, including any data to confirm inferred positive impacts of Nashua WWSDF on WQ.
5. Chapter 3, Sections 3.3.1 – 3.3.11 states that interceptors were constructed in the 1970s. The ICP needs to note if any assessment of the interceptors has been done.
6. Chapter 3, Section 3.3.2 states that there are nine permitted CSO stations, but the First Street Station is out of service and inoperable. The City needs to indicate if this CSO site can be abandoned and sealed off.
7. Chapter 3, Section 3.3.2 states that several outfalls that are below river level are equipped with flap gates. The City needs to indicate any routine inspection or maintenance of these flap gates.
8. Chapter 3, Section 3.5 states that dry weather flow to DIWTF is 32 mgd with peak wet weather flows of 110 to 115 mgd. During wet weather events, a portion of the primary effluent bypasses secondary treatment and flows directly to disinfection. The City needs to confirm that full primary treatment of combined flows is provided (i.e., solids removal rates and weir overflow rates) for all wet weather events up to the stated peak of 115 mgd.
9. Chapter 3, Section 3.5.1.5: The disinfection contact times of flows under high wet weather flow events (110 to 115 mgd) needs to be provided to confirm it is adequate.
10. Chapter 3, Section 3.6: The ICP needs to include basic information regarding the pump stations including age, capacity, redundancies, and plans for capital improvements (if any).
11. Chapter 4, Section 4.1: Please include the rain gauge locations on Figure 4-1.

12. Chapter 4, Section 4.2: Although model schematics of the CSO stations are provided, it would be helpful to provide a larger size map in the appendix depicting the entire modeled network with a legend depicting manholes, pipe sizes, regulators, CSO stations, flowmeter locations, and any other relevant features.
13. Chapter 4, Section 4.4 and Appendix D: The model calibration results show generally good calibration and verification accuracy for dry weather peak flow, depth and volume simulations. For wet weather, the calibration and verification accuracy results for volume show good correlation, however for peak flows and flow depths, the calibration and verification is generally only fair, with some meter locations with the majority of results well outside the accuracy tolerances. Additional flow metering will likely be required to further calibrate the model to finalize the design flow criteria for any proposed conveyance, treatment and/or storage facilities.
14. Chapter 5, Section 5.2.1.1.3: The City needs to provide details of its plan to manage FOG in the collection system given the significant number of SSOs that have been attributed to FOG blockages. The City needs to provide the number of SSOs attributed to FOG blockages for the last 5 years.
15. Chapter 5, Section 5.2.1.1.11: The City needs to provide more detail on its maintenance program for catch basin cleaning.
16. Chapter 5, Section 5.2.1.1.12: The City needs to provide the typical or average annual linear footage of CCTV inspection and cleaning of the collection system with the volume of debris removed.
17. Chapter 5, Section 5.5.1: The City requires inflow removal for new development projects but provides no plan for removing existing inflow sources such as connected downspouts and sump pumps. This needs to be included.
18. Chapter 5, Section 5.5.2: The City needs to provide the total linear footage of mains lined to date, the percentage (or footage) that remains unlined, and the schedule for lining those mains.
19. Chapter 6, Section 6.2.1.2 and 6.2.1.3: The ICP needs to provide further documentation in support of the cost estimates for off-line CSO storage and screening/disinfection facilities; the costs of any comparable facilities in the northeast needs to be provided, if available.
20. Chapter 6, Section 6.2.1.4: The ICP states that the green infrastructure costs were developed from previously completed projects in the U.S. The ICP needs to include the specific projects as a reference with the associated unit costs that were used to develop the ICP unit cost.
21. Chapter 7, Section 7.1: The ICP did not include the storage or storage/treatment project for the Walker CSO station in Phase 3. The ICP bases this decision on providing a storage solution that eliminates the largest CSO (approximately 3 MG) in the typical year for a cost of \$32M. By providing storage/treatment on the order of 1 MG, the City could mitigate CSO discharges with potentially only 1 CSO with partial treatment in the typical year. It was noted in the report that public property is available near this station which makes any

project for this station more feasible. This project may need to be considered in successive phases of the CSO abatement program.

22. Chapter 8: Section 8.6 of the financial capability analysis concludes that a high financial burden is placed on the Lowell ratepayers by the proposed ICP projects. Section 8.1 notes that the City has intermunicipal agreements with four surrounding communities who contribute financially to the operation and maintenance of the Lowell facilities. The ICP needs to indicate how the customer communities will or will not participate in the funding of the ICP recommended projects.
23. Chapter 9, Section 9.2.1 provides that the sum of the weighting percentages is 101.84%. The weighting for protection of the Merrimack River's status as a drinking water supply appears low compared to the other criteria weights. Were any sensitivity analyses performed on the weighting values to determine the impact to the scoring and ultimately the scheduling that was proposed? If so, the City needs to provide the sensitivity analyses and a description of the findings.
24. Chapter 10, Section 10.2: The City needs to include with its implementation schedule, as projects are completed, the interim benefits on reducing the frequency and volume of CSOs.
25. Chapter 10, Section 10.6.1: The ICP indicates the City will be implementing a systemwide program to validate estimates of CSO discharge volumes and collect additional system flow and depth measurements. Please provide an update on the schedule for implementing this program.
26. Chapter 11: The ICP notes the City has aging water infrastructure that has the potential to develop new urgent needs. This is also relevant to the conveyance and pumping components of the conveyance and pumping facilities related to the combined system. While the Agencies understand that there will always be an element of "adaptive management" to such needs, the City needs to indicate if there currently any asset management plan, master plan, or capital improvement plan in place for the City's interceptors and pump stations, which were not included in the ICP recommendations.

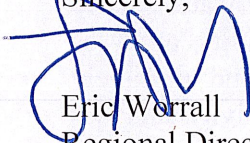
MassDEP and EPA acknowledge the City's substantial investments in its wastewater collection system and wastewater treatment facility to date, much of which has had a direct impact on reducing the activations and volumes of the City's CSO discharges. These actions by the City, as well as CSO abatement actions by the other CSO permittees in the Merrimack River Watershed, have served to improve water quality and further support the wide array of uses of the River. However, it is critical to proceed with further CSO abatement actions to address the substantial impacts of remaining CSO discharges. We appreciate Lowell's efforts to prepare the Integrated Capital Plan, as it has been helpful to understand the costs and benefits of further CSO controls in the City.

MassDEP and EPA look forward to working with the City to put a plan in place and move forward with additional CSO controls. To facilitate discussions on moving forward, please respond to the comments in this letter by March 22, 2021. We would then like to propose a meeting between Lowell, EPA and MassDEP to discuss the Integrated Plan including scope and schedule of the next

phase of the City's CSO abatement program. Lowell's CSO control plan will ultimately need to be integrated into the state water quality standards; the pathways for this process are set forth in the MassDEP and EPA CSO Policies.

We look forward to discussing next steps with you soon. If you have questions or to schedule a meeting you may contact Kevin Brander from Mass DEP at Kevin.Brande@mass.gov or at (978) 694-3236 and Beth Kudarauskas at kudarauskas.beth@epa.gov or at (617) 918-1564. Or, for legal questions, your attorney may contact Toni Bandrowicz at bandrowicz.toni@epa.gov or 617-918-1734.

Sincerely,



Eric Worrall
Regional Director
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Sincerely,

Denny Dart, Chief
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